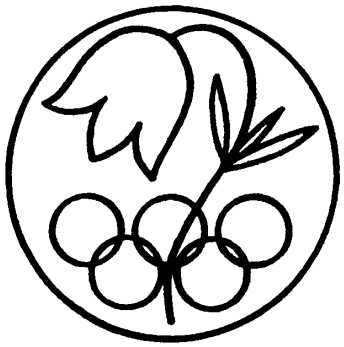
A GUIDE TO THE

INTERNATIONAL BIOLOGY OLYMPIAD

15th revised edition



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A guide to the International Biology Olympiad

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CONTENT

Foreword

This guidebook offers information about the International Biology Olympiad (IBO). It contains the Organization Rules of the IBO, which are officially accepted by all IBO members and have to be strictly followed by all participants.
It also includes a brief history of the IBO and necessary information for new participating countries and future host countries.

The IBO theoretical and practical curricula that have been accepted by member countries and a list of participating countries in the past are included in the Appendices.

1 What is the IBO?

1. Introduction

The International Biology Olympiad (IBO) is a competition for secondary school students. Their skills in tackling biological problems, and dealing with biological experiments are tested. Interest in biology, inventiveness, creativity and perseverance are necessary.
Every participating country sends four students, who are the winners of the respective national competitions. They are to be accompanied by two team leaders as representatives of each country.

2. Aims of the IBO

In bringing together gifted students, the IBO tries to challenge and stimulate these students to expand their talents and to promote their career as a scientist, so biology talents do not get lost. The Olympiad also is focussing on biology as a beautiful and valuable subject. Many biological topics like ethology and ecology stress the importance of biology for society, especially items such as nature preservation and/or environmental protection.

The Olympiad offers the opportunity to compare the syllabuses and educational trends in biology in different countries. This is useful information to improve biology education on a national level.

Many institutions are involved in the organization of the national Olympiad: ministry of education, industry, teachers' associations, universities, schools.
Contacts between these institutions will lead to a better understanding and communication about their respective activities in the field of biology.

3. History

The first international biological competition between Czechoslovakia and Poland from 1985 to 1989 provided ground for the future IBO proper.
Positive experience during international Olympiads in other natural sciences and mathematics led to the idea of starting an international biology Olympiad. So UNESCO asked the former Czechoslovakia to take the initiative.
Six interested countries (Belgium, Bulgaria, Czechoslovakia, German Democratic Republic, Poland and the Soviet Union) founded the IBO in 1989 (Prague and Brno) and participated in the first IBO, which was held in Olomouc in July 1990. Notwithstanding some initial difficulties, this Olympiad was a great success and it was decided to continue with the IBO. In subsequent Olympiads the number of participating countries increased rapidly.

Year	Country	(City)	Number of participating countries
1990	Czech Republic	(Olomouc)	6
1991	Russia	(Machatskala)	9
1992	Slovak Republic	(Poprad)	12
1993	The Netherlands	(Utrecht)	15
1994	Bulgaria	(Varna)	18
1995	Thailand	(Bangkok)	22
1996	Ukraine	(Artek)	23
1997	Turkmenistan	(Ashgabat)	28
1998	Germany	(Kiel)	33
1999	Sweden	(Uppsala)	36
2000	Turkey	(Antalya)	38
2001	Belgium	(Brussels)	38
2002	Latvia	(Riga)	40
2003	Belarus	(Minsk)	41
2004	Australia	(Brisbane)	40
2005	China	(Beijing)	50
2006	Argentina	(Rio Cuarto)	48

Immediately after the first Olympiad, a Coordinating Center was established in Prague and every winter a meeting of appointed coordinators assembles in this center to prepare new proposals and improve regulations, the content, and preparations of future Olympiads, etc.
A list of countries involved in the IBO is presented in Appendix IV.

2 Organization Rules of the International Biology Olympiad

§ 1. Aim of the Competition

1) The International Biological Olympiad (IBO) is a competition for secondary school students who are interested in biology. The sole purpose of this competition is:
   a) to stimulate active interest in biological studies by the creative solution of biological problems,
   b) to promote exchange of ideas and materials about biology education,
   c) to promote regular international contacts between biology students,
   d) to establish friendly relations among young people from different countries and thus to stimulate cooperation and understanding between nations.

§ 2. IBO bodies

1) The governing body of the IBO is the *Board of the Coordinators* that meets annually during each IBO competition. A country that sends students to compete in the IBO must appoint one coordinator to represent the country in this board. The Board of the Coordinators elects one of its members as a Chairperson of the Coordinators to chair its meeting, to represent the IBO in official functions and to keep up contacts with the Coordinating Center of the IBO about its activities. The Chairperson serves a four-year term and can be re-elected. One Vice-chairperson and one deputy Vice-chairperson are elected likewise[1]. The country delivering the IBO Chairperson is allowed to bring a free observer to the IBO.
2) The *Coordinating Center of the IBO* fulfils its activities in collaboration with the Chairpersons of the Coordinators, the member countries and other organizations in accordance with the aims of the IBO. It organizes the annual IBO Advisory Board meeting (cf § 2.3) and functions as the secretariat of the IBO (cf § 5). It is staffed by the Ministry of Education of the country where the Center is located (cf § 5).
3) The *IBO Advisory Board* advises the Board of the Coordinators in maintaining high standards of IBO. The Chairperson of the Coordinators chairs the Board. It consists of representatives of the

[1] 2004-2008: Chairman J. Morélis (the Netherlands); deputies G. Cobut (Belgium) and E. Lucius (Germany)

countries organizing the two previous and the two subsequent IBOs. It may also invite other experts as participants to its annual meeting to prepare recommendations and proposals for the Board of the Coordinators.
Recommendations of the IBO advisory Board concerning the general chapters of the guide will become valid at the end of March each year if no arguments are brought up against it.

4) An *International Jury* is an ad hoc committee formed for each IBO competition. A distinguished scientist appointed by the IBO organizer chairs it. Its members consist of 2 delegates or team leaders from each competing country (cf § 10).

§ 3. Organization of the Competition

1) The official language of the IBO is English.
During official ceremonies the organizing country can also use the language requested by the protocol of the host country.
The host country will also provide a translation of the Theoretical and Practical task in Russian.
2) IBO takes place each year in July in one of the participating countries. IBO is organized by the Ministry of Education or by another analogous institution of the organizing country (only the term 'organizer' is used in the subsequent text).
3) The organizer of IBO ensures equal participation of all delegations and invites all countries accepted as members of the competition.
4) The organizer can invite, on the recommendation of the Coordinating Center (cf § 5), deputies from other countries as observers. These countries can be accepted as regular participants in the meeting of coordinators (cf § 6.4), if they agree with all conditions listed in the Organization Rules.
5) The meeting of coordinators decides on acceptance of a country as a regular member of the competition after sending observers (cf § 6.4). A country, which is not participating in two consecutive Olympiads, or repeatedly does not behave in conformity with the IBO Organization Rules, will lose its membership of IBO.
6) Each country has to indicate within ten years after its first appearance in the competition when it will organize the IBO.
7) All principal questions regarding IBO are decided at the meeting of coordinators (cf § 6 and § 14).

§ 4. Selection of topics for the Competition

1) All disciplines of biology are acceptable for the IBO. More widely oriented topics should enable the competitors to exhibit not only their knowledge and skills, but also their ability to think independently and creatively.

2) The scientific content of the theoretical and practical part of the competition has to follow recommendations contained in Appendix I (Content of the Theoretical Part of the IBO) and II (Basic Skills for the Practical Part of the IBO).
   In the case of an deviation of these recommendations the organizer has to send out in advance, before the end of february, a special letter in the official languages, explaining the character of the deviation.
3) In the practical part, no experiments should be carried out which cause deterioration of the living conditions of vertebrates. No handling of species protected by law in the host country or by UNESCO is allowed.

§ 5. Coordinating Center

1) The Coordinating Center acts as a secretariat of the IBO[2].
   It fulfils the following functions:
   a) it ensures information services for all participants and for the related international institutions (UNESCO, IUBS, etc),
   b) it summons the IBO Advisory Board and the meeting of coordinators if necessary; ensures preparation and distribution of materials to these meetings,
   c) it promotes contacts with other countries,
   d) it coordinates the invitation of observers from other countries by the future host country,
   e) it accumulates relevant documentation about the competition,
   f) it registers and renews addresses of coordinators, their deputies, observers and of institutions taking part in the IBO,
   g) it collects materials and information regarding the IBO and other biological competitions, including descriptions of national biology Olympiads or similar competitions used to select IBO contestants,
   h) it gathers textbooks and syllabuses of biology currently used in participating countries.
2) Members of the Coordinating Center prepare individually or in collaboration with other IBO members specialized texts for the IBO.
3) It presents a yearly report about its activities and the financial situation at the meeting of coordinators.

§ 6. Coordinators

[2] It has been established and it is situated at present at the National Institute of Children and Youth (IDM) in Prague, Czech Republic.

1) The Ministry of Education or another representative institution of participating countries appoints one coordinator and one deputy for the IBO, both citizens of the country and informs the Coordinating Center about this representation and its duration by an official letter.
2) The task of coordinators is to decide at their annual meetings (cf § 2.1) about the principal questions of the IBO and to ensure requirements of the competition in accordance with recommendations for the theoretical and practical part (Appendix I and II).
   Decisions of the Board of Coordinators are taken on the basis of majority votes, in the presence of at least 75 per cent of the coordinators. In case of equal votes, the chairperson of the coordinators takes the final decision.
3) Duties of the coordinators are as follows:
   a) to take part in the meetings of coordinators,
   b) to supply the Coordinating Center with current textbooks and syllabuses of biology and with information concerning the national competitions used to select IBO contestants,
   c) to forward their questions for the theoretical part of the IBO to the organizing country by the end of January each year. Questions should be proposed in the English and/or Russian languages and prepared according to the principles of the Theoretical part of the IBO (Appendix I).
4) Meetings of coordinators are summoned when necessary, usually at the time of IBO performance. The coordinators approve:
   a) changes in the Organization Rules,
   b) countries and cities organizing the forthcoming IBO(s),
   c) countries, which will take part in the subsequent IBO as regular participants.

   Decisions are taken on the basis of majority votes, in the presence of at least 75 per cent of the coordinators. Each country has one vote. In case of equal votes, the chairperson of coordinators takes the final decision.
5) A representative of the Coordinating Center takes part in the coordinators' meeting without the right to vote.
   Defrayment of financial charges connected with the stay of the deputy of the Coordinating Center is covered according to § 13 of the Organization Rules.
6) Financial coverage of meetings of the Coordinators is provided according to § 13 of the Organization Rules.

§ 7. Time-course of preparation of the Competition

1) The meeting of coordinators approves the organizing country at least two years ahead. The regular alternation of all organizing

countries should be respected.

2) The Ministry of Education or corresponding institution of the organizing country sends at least one year ahead to the Coordinating Center its confirmation to accept the responsibility for the organization of the assigned IBO.
3) The Ministry of Education (or similar organization) of the organizing country sends an official invitation to Ministries of Education of all participating countries by the end of November of the preceding year at the latest. Respective copies should be sent to the Coordinating Center in Prague and to the coordinators of all invited countries.
4) The invited countries have to confirm their participation by the end of January each year.

§ 8. Delegations and their members

1) Each participating country fulfilling its duties according to the Rules is allowed to send a delegation consisting of no more than four competitors and two representatives acting as team leaders, both citizens of the country concerned (cf § 6.1).
   Only an official national team can be accepted for the competition.
2) Participation in the IBO is restricted to competitors who
   - are students of a regular secondary school for general education belonging to a state or national educational system (provided such a system exists in the country);
   - are the winners of the national BO of the current school year in their country;
   - are not trained or instructed within a selected group of 50 or fewer students comprising the IBO team for a period longer than two weeks;
   - are born on the 1st of July or later of the actual IBO year minus twenty
   - have not participated already twice in the IBO;
   - have not yet started study at university as regular students.

   Competitors have to bring and sign a declaration confirming the points mentioned above (see appendix III).
3) One of the accompanying representatives is the head of the delegation. Both representatives act as members of the International Jury.
4) Accompanying representatives must be able to translate the text of the written competition questions from English or Russian to the students' native language, to evaluate competition tasks and to correct their solutions.
5) All delegations participating in the IBO will have to arrange their own insurance for accidents, health and travelling.

§ 9. The Competition and the Competition Tasks

1) The competition consists of two parts, theoretical and practical (experimental) examinations. The recommended duration of each part is 4 to 6 hours with a break for refreshment. There should be at least one day interval between the two examinations.
2) The organizers are responsible for the preparation of the competition. The competition tasks are prepared by specialists who also indicate solutions and criteria of evaluation. All these materials become valid only when approved by the International Jury.
3) The competitors receive all tasks translated into their native language. Instruction about the testing procedure should be described clearly in the tasks itself, so no additional verbal instruction and/or explanation about the testing procedure is necessary during the test session.
4) Tests must be constructed so that in fulfilling the tasks students do not have to formulate any word, explanation or clarification in their native language.
5) The organizer announces beforehand all safety precautions, including health care. He is also responsible for providing all participants with basic laboratory and field facilities.

§ 10. The International Jury

1) The International Jury consists of a chairperson (cf § 2.4) and two representatives of all delegations (cf § 8.1). The organizing country appoints the chairperson.
2) The chairperson summons the members of the International Jury and directs their sessions. The International Jury decisions are taken on the basis of majority votes, in the presence of at least 75 per cent of the Jury members. Each country has one vote. In the case of equal votes, the chairperson takes the final decision.
3) Rights and Duties of the International Jury:
   a) the International Jury is responsible for the course of the competition in accordance to the Organization Rules;
   b) the International Jury discusses and approves, in advance, each competition topic submitted by the organizing country, the solution (answer key), and the scoring scheme for evaluation. In case of any suggestions, it makes decisions about necessary changes before the members of the International Jury translate the competition tasks into the students' native language;
   c) the International Jury has the right to check the procedure and results of the evaluation performed by the organizers. This includes verification of the marking process and

inspection of the scores of the students. The International Jury keeps the results of the evaluation secret until the official final announcement,

d) the International Jury approves the final results of the evaluation, confirms the ranking and decides about prizes and awards for the competitors;
e) the International Jury members are obliged to keep secret all information about the competition tasks, results and evaluation until the official final announcement. They must not assist any of the participants during the competition;
f) the International Jury has the right to exclude student(s) and team(s) from the current competition in the case of proved cheating.

4) The decision of the International Jury is final.

§ 11. Evaluation and Prizes

1) The final ranking of the students is based upon their equally weighted scores for theory and practical tasks according to the t-score method. Deviation from this 1:1 principle has to be discussed and agreed upon by the International Jury.
2) The individual papers, tasks and answer sheets of the students will be assessed and marked by the authors of the competition tasks and solutions. The International Jury makes the final decision concerning classification of the results. The marked and assessed original papers, tasks and answer sheets of the students will remain in the possession of the organizers who will archive them for a period of two years.
3) The International Jury should announce the official results together with awards to individual students. The number of gold medals will be limited to approximately 10 % of the number of participants, the number of silver medals will be limited approximately to 20 % of the number of participants and the number of bronze medals will be limited approximately to 30 % of the total number of competitors.
   In addition to medals, the award of other prizes is possible, if agreed upon in advance by the Jury. Medals and prizes must not be of significant material value.
   The results will be proclaimed on an individual basis and not as a national team result.
4) Each competitor will obtain a certificate that recognizes his/her participation in the International Biology Olympiad.

§ 12. Duties of the Organizers

The organizers will ensure:

1) Preparation and mailing of invitation letters (including announcement about financial contributions of participants and observers) and information on preparatory tasks of the IBO to all participating countries and to the Coordinating Center of the IBO.
2) Preparation of competition tasks, author's solution and marking of the individual results for the International Jury.
3) Material and other requirements necessary for the competition, in accordance with the approved Organization Rules.
4) The assistance of translators and interpreters during all IBO sessions.
5) Observation of secrecy and confidentiality during the competition and safety regulations of all competitors of IBO.
6) The supervision during the competition in cooperation with the International Jury.
7) The preparation of a final report including evaluation and statistical analysis of the results within one year after the competition.

§ 13. Financial Expenses

1) The host country organizing the competition will expect each participating country to pay a participation fee. This fee will be proposed three years before and fixed one year before the actual IBO[3]. This fee should be paid before or at the start of the IBO as requested by the organizers in an official letter, including information about the remittance procedure and about any financial consequences in the case of arriving earlier or departing later than scheduled by the organizers.
   In addition, each participating country has to pay the travel expenses of their competitors and accompanying persons to the competition site in the host country. All other expenses of persons listed in § 8 in accordance with the organization program, including the expenses for accommodation and board (3 meals per day a minimum) for delegation members and interpretation will be covered by the host country.
2) The expenses of observers and supernumerary accompanying members are to be covered by the delegating country. This fee is appointed by the organizers and specified in the invitation letter (cf § 12.1 b).
   The organizers of the two subsequent IBOs can send two additional observers providing that these two observers will belong to the official team organizing the future IBO with preferably one of

[3] For the year 2007 (Canada) the fee is fixed upon USD 1500 per country

them nominated as the Chairperson of the International Jury. The expenses of their stay will be settled in the same manner as for persons listed in § 8.

3) In order to fulfil its function, the Coordinating Center of the IBO will receive a yearly contribution of USD 250 from each country participating in the IBO, which should be paid before or at the start of an IBO competition as requested by the Coordinating Center in an official letter including information about the remittance procedure. Changes of the annual amount of this contribution can be settled a year ahead in the meeting of coordinators.

§ 14. Conclusion

1) The countries taking part in the competition and all delegation leaders are obliged to observe the Organization Rules previously specified.
   Countries repeatedly infringing the Rules without adequate explanation may be issued a warning and, if without effect, they will be suspended from the competition for at least one year.
2) Changes in these Organization Rules can be made only at a meeting of the coordinators of IBO, which become valid after the completion of the current IBO.
3) Any matter that is not included in the Organization Rules will be decided upon in the meeting of coordinators.

3 Guidelines for a new participating country

1. Which countries can participate in the IBO?

Any country from which an official observer was sent to an IBO is eligible to participate in the future IBOs. The decision regarding acceptance of a new participating country is made in the meeting of coordinators. The host country of an IBO will send invitations to previously participating countries and countries that sent observers to the previous IBOs, by the end of November of the preceding year. Invited countries should confirm their participation by the end of January of each year.

2. What is the role of the Ministry of Education?

The Ministry of Education, or other equivalent education organization, represents the official authority of a country. It appoints an IBO coordinator and informs in an official letter the IBO Coordinating Center about the name and address of the coordinator, who will be contacted in all IBO matters.
The Ministry will then manage to send a national delegation of four student competitors and two team leaders, according to the qualifications specified in the IBO Organization Rules, to the IBO competition.
It is advised to provide the participating delegation with a small amount of pocket money.

3. How are the four students selected?

The selected four students participating in the IBO must be participants and winners of the final round of the National Biology Olympiad (NBO), organized in each country in the current school year and in which only students from secondary schools for general education can participate. (c.f. Rules § 8.2). Participation of students not competing in all rounds of their NBO is not allowed. For this reason each country has a duty to send a description of their NBO and IBO team selection procedure to the IBO Coordinating Center. This description will follow the format provided. See Appendix V.

4. Who pays for the expenses?

Every participating country pays an annual membership fee (currently settled at USD 250). Every year this fee will be collected by the IBO host, who will transfer it to the IBO Coordinating Center.
A participating country is also expected to pay an annual appointed fee

to the host country[4]. In addition, it is responsible for the travel expenses of its delegation team to and from the competition location. The organizers must specify the expenses of additional accompanying persons in advance.
Should a country be unable to pay the above mentioned contributions a request can be sent to the host country in order to waive the fee. This procedure ensures that inability to pay does not exclude a country's participation in the IBO.
During the IBO the host country will cover expenses and take care of food, accommodation and excursions of the four competitors and the two team leaders.

5. Who writes the test questions?

Each participating country has to submit a required number of test questions for the theoretical part to the host country. The questions must follow the Content of Theoretical Part of IBO (Appendix I) and correspond with the content of general (not specialized academic) biology textbooks. The questions – together with the proposed and explained correct answer key – should reach the host country by the end of January prior to the IBO (unless a later time is stated in the invitation letter). These questions should be in line with *Considerations concerning the theoretical test of the IBO.* All countries should check beforehand their example questions for the theoretical test by assessment experts before these questions are forwarded to the IBO host. The host country is responsible for the selection of the submitted test questions for the theoretical part and for the preparation of the practical part.
The design of the questions should enable objectively marking and scoring, e.g. multiple choice, true/false, matching, filling in numeric, or alphabetical codes which may be chosen from a provided list with terms. The utilization of drawings and the use of video recordings are strongly recommended. Everyone sending questions to the organizers of the IBO has to guarantee that these questions are not subject to strict copyright regulations. Sending questions automatically means that they are free for non-commercial use.

6. What are the functions of the team leaders?

During the IBO week they will function as members of the International Jury, which involves the following tasks:

a. approval of the theoretical and practical test questions and evaluation;

[4] For 2007 the fee is fixed upon 1500 USD per country.

b. translation of the test questions into the native language of their students;
c. supervision of the competition in cooperation with the organizers;
d. approval of the competition tasks, answer keys, marking and awarded scores.
e. deciding about the ranking and awarding of medals to the winners.

7. Other responsibilities of the participating country.

The participating country is expected to
a. strictly obey the IBO Organization Rules;
b. indicate within 10 years of participation when it will host a future IBO
c. promote mutual understanding and academic cooperation through IBO.

In the case of a change of the national flag of a country the coordinator of this country has to inform the next IBO host and the Coordinating center about this change.

Political activities and propaganda of invited IBO teams frustrating the aims of the competition are strongly disapproved, judged as a violation of the Rules and may lead to exclusion of the delegation concerned.

All coordinators have to supply the IBO webmaster with the correct information and URL of their own national website.

8. How to set up a national biology Olympiad.

The organization (number of rounds, contents of tasks, etc) and financing of NBO 's may differ considerably. The committee responsible for the NBO can belong to the ministry of education, teacher association, university or even an educational authority like a foundation for nature preservation or curriculum development.
Very often cooperation between these institutions is useful. Students are selected in one or more rounds in which they have to deal with test questions. In some countries students take their tests at a university, but normally the tests are taken at schools in cooperation with teachers, while a small assessment team is responsible for the questions that are sent to the schools participating in the NBO.

The number of selection rounds varies from one to three or even more. In the case of just one selection round at once the four winners of NBO of the country are known. After selection, the finalists are trained together during some time in scientific and biological skills. The length of this training varies per country from a few days to two weeks at

maximum. In order to avoid specialized training before the IBO the maximum length of training in a group smaller than 50 students should not exceed two weeks.
Example questions of the IBO are available on the IBO website. The use of complete tasks of former IBOs in national test rounds and for training purposes is allowed, but publication of theoretical tasks (particularly on the Internet) should not happen within two years after their use in the IBO.

Some countries do have a last round that is a combination of selection and training. In this case a small group consisting of more than four finalists are brought together and trained. At the end a final practical and/or theoretical test decides which four students will be selected as representatives of the country in the international Olympiad (cf Rules § 8.2).

In most cases the award of the prizes in the national competition takes place during an official ceremony by a well-known biologist or important personality in education. Often the last round is not only a training in specific biological subjects; it also includes some entertainment. Cultural activities may be on the agenda and extra attention should be paid to stimulate the scientific development of these talented students.

Often biology departments of universities are interested in being a partner in the Olympiad as this activity stimulates biology as an attractive future university study for secondary school pupils. Contacts between secondary and academic education also favors discussions about programs and direction in study. So universities very often are the host of the group of Olympic finalists and participate in the organization responsible for preparing and marking the various test rounds.
In some countries publications about the competition appear in (semi) scientific national journals including the regular journal of the National Association for Science or Biology Education. Biotechnological industries sometimes host the Olympic candidates for an excursion or sponsor one or more of the winners by paying their trip to the IBO.

If information leaflets and posters about the Olympiad are sent to schools all over the country this sometimes is financed by revenues obtained by advertisements of educational publishers, manufacturers, teacher training centers, associations for the promotion of biology, universities, industries or even banks.
These are also the institutions that often are willing to offer prizes to be given to the winners of the national competition, during the final ceremony.

4 Guidelines for the host country

1. How does a country become the host country of an IBO?

A country, which has been participating in the IBO, must state at latest 10 years after its acceptance as member of the IBO its intention to host an IBO in a certain year. This official statement must be sent to the IBO Coordinating Center at least two years before the intended year to host the IBO. The approval of a host country is made at the meeting of coordinators at least two years in advance (cf Rules § 7.1).

2. What is the role of the Ministry of Education of the host country?

The Ministry of Education (or an analogous institution) represents the official authority of the host country. It appoints an organizing committee and subcommittees and it sends the official invitation letters, including information about possible financial conditions and other duties related to the IBO membership.
It also assigns an organizing institution and the IBO competition site. The committee and subcommittees are responsible for the preparation and the activities of the IBO.

3. What are the main responsibilities of the organizing committee and its subcommittees?

The organizing committee and its subcommittees have the following responsibilities:

3.1 Sending information about the IBO to the participating countries and observers by the end of November of the year before the IBO year, including conditions like sending questions for the theoretical test.

3.2 Preparation of tasks in correct English and Russian, to be checked by a native speaker who is a biologist.
The official language of the IBO is English.
As a courtesy to Russian speaking countries the host country will still provide a translation of the practical and theoretical tests into Russian for countries requesting it. Producing a Russian translation beforehand offers a useful check of the correct wording and comprehensibility of the “mother” (English) version. However, the discussion during all Jury meetings will only be in English.

3.3 Organizing the IBO, which includes
- opening and closing ceremonies;
- Jury meetings;
- conducting the competition, both theoretical and practical;
- excursions;
- assurance of conditions for work of the International Jury;
- coordinators' meeting;
- preparation of medals for the winners;
- preparation of certificates for all participating members; winners of gold, silver and bronze medals should have some indication about their medal on their certificate of attendance.
- conducting all IBO activities in English.

3.4 Arrangements for food, accommodation and transportation to and from the Airport and/or the Railway Station for all participating members and observers.

3.5 Appointment of a chairperson of the Jury to chair the Jury sessions, which include translation, approval of test questions and evaluation, and approval of test scores and awards.

3.6 Arranging facilities, such as photocopying, photo- and/or video documentation, computer processing of achieved results.

3.7 Distribution of a new updated version of the list with addresses including email of all coordinators and team leaders.

3.8 Providing the Coordinating Center after the competition with a copy of the files of the complete English and Russian final version of the tests.

3.9 Providing each country after the closing ceremony with a copy of their translated version of the tests and the filled out answers sheets of their students.

3.10 Take care that an example of correct answers of the tasks (the ideal author solution) should be available to delegation leaders and students by the end of the Olympiad.

3.11 Store the originals of the translated tests for at least two years and perform a random check on the quality and integrity of the translations of countries belonging to the gold and/or silver medals. For evaluation and checking purposes these originals are available for others after approval by the Coordinating Center in Prague.

3.12 Preparation of a final report within one year after the competition.

3.13 In the current year of the IBO the group responsible for training the national team of the host country for the IBO should be strictly separated from the expert committee of the host country responsible for the design of the IBO tasks.

4. What is the financial responsibility of a host country?

The host country must pay for all activities of the hosted IBO during the specified week, except for the travel expenses of the participating

members and the observers to and from the city or town where the IBO takes place.
The host country may request each participating country to pay a fee[5] to the host country. This fee is to be used to cover a part of travel and living expenses. The host country also determines the fee for the observers and informs them in advance. Conditions for extra days at the competition site before and after the Olympiad have to be clearly specified in the invitation letter sent to all countries.

5. Preparation of the IBO tasks

General

The host country must appoint a committee of authors responsible for the construction of the IBO test. The members of this committee should be specialists in Biology and secondary school biology.
The committee must study and understand the concept of IBO, previous IBO test questions, the *Content of the theoretical part of IBO* (see Appendix I), Basic skills for the Practical part of the IBO (see Appendix II) and recommendations and principles in relation to the design of valid and reliable tasks.
Biological notions and principles necessary for solving the tasks should be included in general (not specialized) biology textbooks like:

- Biology, 5th edition by Campbell, Publ. Addison Wesley Longman
- Life, the Science of Biology, 5th edition (1998) by Purves et al, Publ. Freeman and Co (ISBN 0-7167-2869-9)
- .....

Remark: A goal of the IBO is stimulating the international exchange of ideas and materials about syllabuses, curricula, topics, didactic approach and skills in relation to biology education. So every three years all delegations will bring their secondary education biology textbooks to the IBO, which will be shown and exhibited in a special session.

It is recommended to pre-test the IBO tasks with an appropriate target group (different from IBO students) of the host country and have the English and Russian version of the tasks checked by a native speaker who is a biologist (cf.3.2).

Assessment experts should be involved in the design of the test questions, the structure of the tasks as a whole and the marking and ranking procedure. So called piling up questions leading to possible cascade mistakes should be marked in a way that is fair to the students, allowing for consequential error. Tasks should be designed in

[5] For the year 2007 this fee is fixed upon USD 1500.

such a way that the answers are precise and can be objectively evaluated.

A range of scores should be allowed for answers reflecting a different range of ability and evaluation procedure must be indicated and approved by the Jury during the test translation and Jury session.

If knowledge of a special term or explanation is required, students should not be asked to write this in their own language. They should have to choose the correct number from a list of numbered terms or explanations.

In order to facilitate the translation procedure and make it possible to write translations in between the lines, tasks will be word-processed with double spacing.

Both Theoretical and Practical task will have specially designed answer sheets (apart from the test papers) for the students. This will speed up the copying process of the filled out papers of the students (answer sheets means fewer copies compared to the total task) and facilitate the work of the local marking team.

In order to secure anonymous marking code numbers will be used instead of names for each participant. An explanation of the coding procedure will be included in the written instruction on the front page of the tasks in native languages. Oral instruction at the start of test sessions should be avoided. Nevertheless it is advised that competitors will understand some English.

Calculators to be used in the tasks will be provided with simple statistical functions and distributed among students at their arrival at the competition site. Students will be informed that they have to bring and use these calculators during the tasks. Using own calculators is not allowed and will lead to subtraction of points.

The main author (or the chairperson of the committee) is responsible for the design of the proposed tasks and how each question is to be evaluated (marking procedure). The test time should be something in between 4 to 6 hours. Refreshment will be available for students.

Theoretical Task

Theoretical questions are selected from the questions sent by the participating countries, according to the *Content* outline. In order to improve the reliability of the theoretical task and on the other hand reduce the required number of questions the theoretical task should contain not only multiple choice questions but also as many questions as possible focusing upon

- matching a set of aspects
- filling out a number, letter or code
- judging a set of statements about a biological problem or phenomenon
- sequencing a set of aspects or events

The total number of IBO theoretical questions should not exceed 80. All questions should focus on reasoning, problem solving and understanding. Questions dealing with just knowledge should be expelled.

All countries will have checked beforehand their example questions for the theoretical test by assessment experts before these questions are forwarded to the IBO host

Practical Task

The practical test must follow the *Basic skills of the practical part of IBO* (see Appendix II). Any skill and biological, c.q. scientific term beyond the approved *Basic skills* and *Content*, if required, must be specified in a preparatory text, sent by the organizers to the coordinators of the participating countries by the end of March.
The following suggestions may be useful for the preparation of the practical part:

- Due to the increasing number of competitors, the organizer may divide the practical part into several sections in which students take turns. In that case the organizing committee must ensure that all groups and all students are provided with equal laboratory materials, equipment and instructions.
- The practical test questions should be as concise as possible. They should be presented in graphic form as much as possible and without any need for additional instruction from the laboratory attendants.
- Testing procedures have to provide all students with identical conditions and equipment.

- If necessary, prior to the examination students should be allowed to become acquainted with specific or unusual equipment to ensure fairness.
- The laboratories should be spatially arranged in order to avoid meeting among students during room switching or breaks.
- In practical tasks dealing with ethology the use of video is an acceptable option

6. Translation and testing procedure

The host country is advised to ensure a sensible distribution of all countries over the seats in the room during Jury sessions, e.g. according to languages.

At the start of the discussion of the theoretical task an overview will be presented to the international Jury of questions and countries being the sender of these questions.

To speed up discussions during jury meetings proposals for adjusting test questions should be first discussed individually with experts from the local group of authors about the tasks and afterwards in the plenary session. Discussion of IBO-tasks will focus upon the biological content and/or assessment aspects. Upgrading the wording to better English need not to be discussed.

Experts and interpreters involved in the translation of tasks, taking care of the (word) processing corrections during Jury meetings and processing the statistical evaluation of the results should have a biological background. Countries willing to use computer for translation of the tasks should bring their own keyboard.

While translating every delegation will check the answer key provided by the organizers. The approval of the answer key and the discussion and translation of the IBO theoretical tasks by the International Jury will be in one session.

Experts and interpreters involved in the translation of tasks, and (word) processing corrections and the statistical evaluation of the results should have a biological background. The statistical evaluation will include average scores and item-test correlations (Rit).

If for a certain country, no official names in the local language are available in the topic Biosystematics, students should use correct scientific names.

The local task committee responsible for the tasks should be prepared to defend the questions and answer key properly. In this respect it is necessary that the questions sent for the theoretical task should be provided with a list + explanations of the correct answers.
Also, during the translation procedure and approval of the answer key of the theoretical task a list should be available showing which country sent which question.

The quality and integrity of the translations of each country will be checked. Student guides or local experts could be involved in this process but only after the actual test session.

During meetings of the International Jury all delegation leaders will have to switch off their mobile phones.
During the competition the use of electronic communication devices is completely forbidden for students. Students have to sign a declaration about this (see appendix III).

In order to reduce possible confusion during voting about the number of votes it is advised that every country will be provided with special vote cards.

The organizers have the duty to show during the first International session the equipment and materials to be used by the students during the practical task.

During the tests objective inspectors appointed by the jury should be present to check whether the testing conditions are in accordance with the Rules. Inspectors will be recruited among Jury members of past and near future IBO organizers and among newcomers attending the IBO as observer without a team.
Supervisors of the organizers should be informed beforehand about the existence and attendance of the inspectors. Inspectors should be identifiable by a special badge and in no way interfere with the assessment procedure.
Check points for inspectors are:

* Start & finish: no disturbing (too) long lasting announcements in English (the instruction on the tasks itself should be sufficient)
* Condition in the room: temperature, smell, noise, light
* Quality of equipment and materials
  (inspectors should have the possibility to check this, e.g. quality of slides with a microscope)
* Solving problems by supervisors in case of failing or lacking materials
* Positioning of the students (spatial arrangement, enough room on their tables)
* Irregularities:

- coping with superfluous or unnecessary questions of students
- cheating or cribbing
- possibility of students to observe manipulations of other students
- too much (in between) announcements
- students talking with each other

* Availability of refreshments
* Shift procedure in between labs
* Differences in speed/progress of students with their tasks
* Available time for students in relation to the length of the tasks

At the start of each session of the practical task students should be provided with fresh materials and proper functioning equipment. On the front page of the tasks students will be told/reminded to ask supervisors for substitution of inadequate materials or equipment and the organizers should have spare materials and equipment available.

Directly after the tests, helpers appointed by the jury will assist the organizers in photocopying all answer sheets and save these copies in a sealed envelope.

In case of complaints about equipment and specimen students should indicate their objection on their paper and have it signed and commented by a lab assistant. In case of an unjust complaint a student will loose all points for the experiment concerned.

7. Answer key, marking, ranking

An example of the proposed correct answers (the ideal author solution) of the practical and theoretical tasks should be available to students and delegation leaders after students have fulfilled these tasks

Deleting questions should not be allowed after the jury members have had contact with their students once they have completed their tasks. Exceptions are only allowed and may be necessary in the case of clear statistical evidence, e.g. negative item-test correlations (Rit).

Organizers should be aware that it is essential to ensure having enough markers plus experts for producing the preliminary scores + statistical results, which have to be presented to the International Jury for a check. During this checking procedure (*extra)* copies of the translated test papers and answer sheets should be available for team leaders. While checking the awarded scores delegation leaders will only have access to the papers of their own students plus their awarded scores and nothing more. No lists should be available or distributed with total scores and/or names of the students.

While marking, the local marking team will indicate their awarded scores on the answer sheets of the students and the total score on the front page. This will facilitate the checking of the marking by the International Jury.

The final ranking of the students is based upon their equally weighted scores for theory and practical tasks according to the t-score method (c.f. §11.1).

During the decision procedure of the awarding of medals delegation leaders will only have a list with adjusted scores (original scores multiplied by a secret factor and no names of the students or countries).

The final ranking and medal distribution will be secret until the official announcement in the closing ceremony.

8. What does an IBO program look like?

1st day (Sunday)	Arrival of delegations
2nd day (Monday)	Opening ceremony in the morning Jury session in the afternoon: - presentation of the team of authors - general concept of the competition - explanation of the structure of the tests - total proposed number of points for the theoretical and practical tests - presentation of the practical test with evaluation procedure including demonstration of the materials and equipment necessary to fulfil the practical tasks - appointing inspectors, recruited from future and past organizers and observers, who will witness at random the actual practical test session - discussion and approval in portions of the practical test and its marking procedure - translation of the practical task into native languages - checks on translations
3rd day (Tuesday)	Practical test for students in shifts After the test: ideal author solution available for students and delegation leaders
4th day (Wednesday)	Jury session: - report of inspectors present during practical test

	- presentation of the theoretical test questions and evaluation procedure - appointing inspectors who will witness at random the actual theoretical test session - discussion and approval in portions of the theoretical test, its answer key and its marking procedure - translation of the theoretical test into native languages. - checks on translations
5th day (Thursday)	Theoretical test for students Jury session (in the afternoon): - checking the marking process: team leaders analyze, discuss and approve the awarded scores by the marking team and the statistical evaluation of the results of the practical test. Remark: for team leaders the test papers and copies of the marked answer sheets of their students should be available. - report of inspectors present during theoretical test Meeting of coordinators in the evening
6th day (Friday)	Jury session in the afternoon or evening: - checking the marking process: team leaders analyze, discuss and approve the awarded scores by the marking team and the statistical evaluation of the results of the theoretical test. Remark: for team leaders the test papers and copies of the marked answer sheets of their students should be available. - determine balance in scores for theoretical and practical test (normally 50% - 50%) in the final ranking. A change in the 50:50 ratio should be based upon the statistical evaluation.
7th day (Saturday)	Jury session in the morning (or Friday night): Approval of the competition results and awarding of medals Afternoon: Closing ceremony
8th day (Sunday)	Departure of delegations

Note: Excursions and cultural activities are organized for students, jury members and observers during their free times throughout the course of the IBO. Separation of Jury members from students must be assured between the Jury session and the theoretical or practical competition respectively.

9. What is the usual protocol during the opening and closing ceremonies?

Opening:

1. Entry and presentation of the IBO cup.
2. Lining up of all participating teams with their national flags, in alphabetical order.
3. Opening address and words of welcome by invited prominent Master of Ceremonies and other speakers alternated with cultural and/or musical performances.
4. Oath by the competitors' representative while all competitors are standing and raising their right hand.
   Oath *We, competitors of this International Biology Olympiad solemnly swear that we will answer the theoretical and practical competition questions in the most responsible way and we will compete honestly according to the principles of "Fair Play*".
5. Oath by a representative of the International Jury while all delegation leaders are standing and raising their right hand.
   Oath *We, the members of this International Biology Olympiad Jury, solemnly swear to judge the competition according to the valid Rules accepted for this Olympiad and according to the principles of "Fair Play"*.

Closing:

1. Entry of all participating teams (flags are already on the stage).
2. Address by the main author or president of the IBO about the competition and other speakers.
3. Announcement of awards and medal presentation in reverse order with a clear distinction between bronze, silver and gold.
   The overall winners number 1, 2 and 3 will receive special attention during the medal award ceremony.
4. Interval with musical and/or cultural performances
5. Distribution among each national team the certificates of attendance while lining up on the stage.
6. Handing over the IBO cup to the host country of the next year.
7. Closing addresses.

Remark: Directly after the closing ceremony plenty of copies of the final ranking and results will be available for Jury, competitors and press

APPENDIX I:

Content Theoretical part of the IBO

The IBO theoretical examination should concentrate on biological concepts applied to the majority of organisms of the same group. It should not contain specific facts, exceptions or knowledge about local organisms that require special or local experiences.
The majority of questions should test students' understanding, science process skills and application of their biological knowledge. The questions testing only knowledge should be as few as possible and they should not exceed 25 % of the total points.
After approval of the test questions by the International Jury the maximum obtainable points for correct answers of each particular question have to be stated in the examination papers.

Questions concerning Principles of Scientific Reasoning and Principles of Biological Methods should be included in the Theoretical test, which should cover the following 7 topics in the indicated proportions.

In the IBO tasks the names of organisms will be the national names (no description) together with the scientific names (Latin) in brackets. Any description instead of name is prohibited. The organizers should construct the questions so that the name of the organism is not a key element for answering; otherwise they should use very well known organisms (general representatives of a group) mentioned in the list for biosystematics.

I Cell biology : (20 %)[6]

Structure and function of cells

* Chemical components
  - Monosaccharides; disaccharides; polysaccharides
  - Lipids
  - Proteins: amino acids, three letter symbol; structure of proteins;
  . chemical classification of proteins: simple proteins and conjugated proteins
  . functional classification of proteins: structural proteins and enzymes
  - Enzymes
    . Chemical structure: apoenzyme and coenzyme

[6] Percentage representing points in the test

. Model for enzyme action: enzyme binds with substrate
. Denaturation
. Nomenclature

- Nucleic Acids : DNA, RNA

- Other important compounds
  . ADP and ATP
  . NAD^+ and NADH
  . $NADP^+$ and NADPH

* Organelles

nucleus
- nuclear envelope
- (nucleohyaloplasm)
- chromosomes
- nucleoli

cytoplasm
- cell membrane
- hyaloplasm
- mitochondria
- endoplasmatic reticulum
- ribosomes
- Golgi apparatus
- lysosomes
- vacuole membrane
- proplastides
- plastides
  . chloroplasts
  . chromoplasts
  . leucoplasts)
  (e.g. amyloplasts)

Plant cells are surrounded with a cell wall

* Cell metabolism
- Breakdown of carbohydrates
. Anaerobic break down (anaerobic respiration) of glucose: glycolysis
. Aerobic break down (aerobic respiration) of glucose: glycolysis
  citric acid cycle
  oxidative phosphorylation
- Dissimilation of fats and proteins
- Assimilation
. Photosynthesis
  . Light reaction
  . Dark reaction (Calvin cycle)

* Protein synthesis

- Transcription
- Translation
- Genetic code

* Transport through membranes
  - Diffusion
  - Osmosis, plasmolysis
  - Active transport
* Mitosis and meiosis
  - Cell cycle: interphase (replication) and mitosis (prophase - metaphase - anaphase - telophase)
  - Chromatids, equatorial plate, haploid and diploid, genome, somatic and generative cells, gamete, crossing over
  - Meiosis I and meiosis II.

Microbiology

* Prokaryotic cell organization
* Morphology
* Phototrophy and chemotrophy

Biotechnology

* Fermentation
* Genetic manipulation of organisms

II Plant anatomy and physiology (15 %)

(with emphasis on seed plants)

Structure and function of tissues and organs involved in:

* Photosynthesis, transpiration and gas exchange
  - Leaf : structure; function stomata
* Transport of water, minerals and assimilates
  - Root : structure (endodermis)
  - Stem : structure (vascular bundles)
* Growth and development
  - Apical meristem and cambium
  - Germination

* Reproduction (ferns and mosses included)
  - Asexual reproduction (clone forming)
  - Sexual reproduction
    . Structure of flowers
    . Pollination
    . Double fertilization
  - Alternation of generation in seed plants, ferns and mosses

III Animal anatomy and physiology (25 %)
(with emphasis on vertebrates and especially man)

Structure and function of organs and tissues involved in

* Digestion and nutrition
  - Digestive tract (including liver, gall bladder and pancreas)
  - Mechanical and chemical breakdown of food
  - Absorption
  - Food components (water, minerals, vitamins, proteins, carbohydrates and fats)
* Respiration
  - Breathing mechanism
  - Gas exchange
  - Respiratory organs
* Circulation
  - Blood : blood plasma, red blood cells, white blood cells, blood platelets
  - Blood circulation : arteries, capillaries, veins, heart
  - Lymphatic system : tissue fluid, lymph
* Excretion
  - Structure of the renal system
  - Urine production
* Regulation (neural and hormonal)
  - Nervous system : peripheral nervous system, central nervous system (spinal cord and brain), autonomic nervous system (sympathetic and parasympathetic), reflexes, sense organs (eyes and ears)
  - Endocrine system : pituitary gland, thyroid gland, islets of Langerhans, adrenal medulla, adrenal cortex, ovaries and testes
* Reproduction and development
  - Structure and function of male and female reproductive systems
  - Ovulation and menstrual cycle
  - Fertilization
  - Formation of ectoderm, mesoderm, endoderm
  - Embryonic membranes

* Immunity
  - Antigens, antibodies

IV Ethology (5 %)

* Methodology of Ethology
* Innate and Learned Behavior
* Communication and Social Organization
* Foraging Behavior
* Defensive Behavior
* Mating systems and Parental care
* Biorhythms

V Genetics and Evolution (20 %)

* Variation : mutation and modification
* Mendelian inheritance
  - Monohybrid cross
  - Dihybrid cross
  - Polyhybrid cross
* Multiple allelism, recombination, sex linkage
* Hardy-Weinberg principle
* Mechanism of evolution
  - Mutation
  - Natural selection
  - Reproductive isolation
  - Adaptation
  - Fitness

VI Ecology (10 %)

* Individual Organisms
  - Unitary and modular organisms
* Population
  - Population structure
    . dispersion, age, size and sex structure
  - Population dynamics
    . birth rate, death rate
    . exponential and logistic growth, carrying capacity
  - Population regulation
    . metapopulation dynamics
* Biotic Communities
  - Species reachness and diversity
  - Niche, competition exclusion principle
  - Interspecific Interactions
    . competition, predation, symbiosis
  - Community dynamics
    . succession
  - Terrestrial biomes

- Aquatic biomes

* Ecosystems
  - Trophic structure
    . food webs
  - Trophic levels
    . producers, consumers, decomposers
  - Energy flow
  - Productivity
    . gross and net primary productivity
    . energy transfer efficiencies
  - Matter flux through ecosystems
  - Global biogeochemical cycles
* Biosphere and man
  - Human population growth
  - Pollution
    . threats of biodiversity
    . in situ conservation
    . ex situ conservation

VII BIOSYSTEMATICS (5 %)

- Structure and function, evolutionary and ecological relationships among typical organisms in the following groups. Knowledge of scientific terms will not be required for successful solution of the tasks. However, competitors should know what the named representatives of genera mentioned below look like.

Domain Archaea	*Methanobacterium, Halobacterium,Thermoplasma, Sulfolobus*
Domain Bacteria	*Agrobacterium, Anabaena, Bacillus, Escherichia, Rhizobium, Salmonella, Streptomyces*
Domain Eukarya	
Kingdom Protista	
D. Rhodophyta	*Chondrus*
D. Phaeophyta	*Sargassum*
D. Bacillariophyta	*Navicula*
D. Euglenophyta	*Euglena*
D. Chlorophyta	*Chlamydomonas, Spirogyra, Chlorella, Ulothrix*
P. Rhizopoda	*Amoeba*
P. Zoomastigophora	*Trypanosoma*

P. Apicomplexa	*Plasmodium*
P. Ciliophora	*Paramecium*
Kingdom Fungi	
D. Zygomycota	*Mucor*
D. Ascomycota	*Claviceps, Penicillium, Saccharomyces*
D. Basidiomycota	*Agaricus*
Kingdom Plantae	
D. Bryophyta	*Polytrichum, Sphagnum*
D. Hepatophyta	*Marchantia*
D. Rhynophyta	*Rhynia*
D. Lycopodiophyta	*Lycopodium*
D. Equisetophyta	*Equisetum*
D. Polypodiophyta	*Pteridium*
D. Ginkgophyta	*Ginkgo*
D. Pinophyta	*Pinus*
D. Cycadophyta	*Cycas*
D. Magnoliophyta	
C. Magnoliopsida	
F. Magnoliaceae	*Magnolia*
F. Ranunculaceae	*Ranunculus, Pulsatilla*
F. Rosaceae	*Rosa, Malus, Prunus*
F. Fabaceae	*Pisum*
F. Oleaceae	*Syringa*
F. Fagaceae	*Quercus*
F. Cactaceae	*Opuntia*
F. Brassicaceae	*Brassica*
F. Lamiaceae	*Lamium*
F. Solanaceae	*Solanum*
F. Asteraceae	*Helianthus*
C. Liliopsida	
F. Liliaceae	*Lilium, Allium*
F. Orchidaceae	*Orchis*
F. Poaceae	*Zea, Triticum, Bambusa*
F. Arecaceae	*Cocos*
F. Araceae	*Monstera*
Kingdom Animalia	
P. Porifera	*Euspongia*
P. Cnidaria	
C. Hydrozoa	*Hydra*
C. Scyphozoa	*Aurelia*
C. Anthozoa	*Corallium*
P. Platyhelminthes	

C. Turbellaria	*Polycellis*
C. Trematoda	*Fasciola*
C. Cestoda	*Taenia*
P. Nematoda	*Ascaris, Trichinella*
P. Mollusca	
C. Gastropoda	*Helix, Arion*
C. Bivalvia	*Ostrea, Mytilus*
C. Cephalopoda	*Sepia, Octopus*
P. Annelida	
C. Polychaeta	*Nereis*
C. Oligochaeta	*Lumbricus*
C. Hirudinea	*Hirudo*
P. Arthropoda	
$_S$P. Crustacea	*Astacus, Daphnia, Cyclops*
$_S$P. Chelicerata	
C. Arachnida	*Euscorpius, Araneus, Ixodes*
$_S$P. Myriapoda	
C. Chilopoda	*Scolopendra*
C. Diplopoda	*Julus*
$_S$P. Hexapoda	
C. Insecta	
O. Thysanura	*Lepisma*
O. Odonata	*Libellula*
O. Blattodea	*Blatta*
O. Phasmatodea	*Carausius*
O. Isoptera	*Kalothermes*
O. Orthoptera	*Gryllus, Locusta*
O. Phthiraptera	*Pediculus*
O. Hemiptera	
$_S$O. Homoptera	*Aphis, Cicada*
$_S$O. Heteroptera	*Gerris, Nepa, Cimex*
O. Coleoptera	*Calosoma, Leptinotarsa, Ips,Tenebrio, Dytiscus*
O. Diptera	*Anopheles, Drosophila, Musca*
O. Lepidoptera	*Papilio, Bombyx*
O. Hymenoptera	*Ichneumon, Apis, Formica*
O. Siphonaptera	*Pulex*
P. Echinodermata	
C. Asteriodia	*Asterias*
C. Echinoidea	*Echinus*
C. Holothuroidea	*Holothuria*
P. Chordata	
$_S$P. Urochordata	*Ascidia*
$_S$P. Cephalochordata	*Branchiostoma*
$_S$P. Vertebrata	
^{S}C. Agantha	*Petromyzon*

^{S}C. Gnathostomata	
C. Chondrichthyes	*Scyliorhinus, Carcharodon*
C. Osteichthyes	
$_{S}$C. Actinopterygii	Acipenser, *Clupea, Salmo, Carassius, Muraena*
$_{S}$C. Sarcopterygii	*Lepidosiren, Latimeria*
C. Amphibia	
O. Caudata	*Salamandra*
O. Anura	*Rana, Bufo*
C. Reptilia	
O. Testudinata	*Testudo*
O. Crocodylia	*Crocodylus*
O. Squamata	*Lacerta, Vipera*
C. Aves	
O. Struthioniformes	*Struthio*
O. Sphenisciformes	*Spheniscus*
O. Ciconiiformes	*Ciconia*
O. Anseriformes	*Anser*
O. Falconiformes	*Falco*
O. Galliformes	*Gallus*
O. Columbiformes	*Columba*
O. Strigiformes	*Strix*
O. Piciformes	*Dryocopus*
O. Passeriformes	*Parus, Passer*
C. Mammalia	
O. Monotremata	*Ornithorhynchus*
O. Marsupialia	*Macropus*
O. Insectivora	*Erinaceus, Talpa*
O. Chiroptera	*Myotis*
O. Rodentia	*Mus, Rattus*
O. Carnivora	*Ursus, Canis, Felis*
O. Proboscidea	*Elephas*
O. Perissodactyla	*Equus*
O. Artiodactyla	*Sus, Bos*
O. Cetacea	*Delphinus*
O. Primates	*Cebus, Macaca, Hylobates, Pan, Gorilla, Pongo, Homo*
“Virales”	Bacteriophage
“Lichenes”	*Parmelia, Cladonia*

APPENDIX II

Basic Skills for the Practical Part of the IBO

The IBO practical examination should concentrate on the evaluation of competitors for their ability to solve given biological problems using the following skills:
In the IBO tasks the names of organisms will be the national names (no description) together with the scientific names (Latin) in brackets. Any description instead of name is prohibited. The organizers should construct the questions so that the name of the organism is not a key element for answering; otherwise they should use very well-known organisms (general representatives of a group) mentioned in the list for biosystematics.

I Science Process skills

1 Observation
2 Measurement
3 Grouping or classification
4 Relationship finding
5 Calculation
6 Data organization and presentation: graphs, tables, charts, diagrams, photographs
7 Prediction / projection
8 Hypothesis formulation
9 Operational definition: scope, condition, assumption
10 Variable identification and control
11 Experimentation: experimental design, experimenting, result/data recording, result interpretation and drawing conclusions.
12 Representing numerical results with appropriate accuracy (correct number of digits)

II Basic biological skills

1 Observation of biological objects using magnifying glasses
2 Work with a microscope (objective max. 45 x)
3 Work with a stereomicroscope
4 Drawing of preparations (from a microscope, etc.)
5 Exact description of a biological drawing using tables of biological terms marked with a numerical code

III Biological methods

Competitors in the IBO should know the following methods and be able to use them. If any method requires extra specific information concerning procedures that depend on special technical equipment, instruction will have to be provided.

A Cytological methods

1 Maceration and squash technique
2 Smear method
3 Staining of cells and slide preparation

B Methods to study plant anatomy and physiology

1 Dissection of plant flower and deduction of flower formula
2 Dissection of other plant parts: roots, stems, leaves, fruits
3 Free - hand sectioning of stems, leaves, roots
4 Staining (for example lignin) and slide preparation of plant tissues
5 Elementary measurement of photosynthesis
6 Measurement of transpiration

C Methods to study animal anatomy and physiology

1 Dissection of arthropods and annelids
2 Whole - mount slide preparation of small invertebrates
3 Elementary measurement of respiration

D Ethological methods

1 Determination and interpretation of animal behavior

E Ecological and environmental methods

1 Estimation of population density
2 Estimation of biomass
3 Elementary estimation of water quality
4 Elementary estimation of air quality

F Taxonomic methods

1 Use of dichotomous keys
2 Construction of simple dichotomous keys
3 Identification of the most common flowering-plant families
4 Identification of insect orders
5 Identification of phyla and classes of other organisms

IV Physical and chemical methods

1 Separation techniques: chromatography, filtration, centrifugation
2 Standard tests for monosaccharides, polysaccharides, lipids, protein (Fehling, I_2 in KI(aq), biuret
3 Titration
4 Measuring quantities by drip and strip methods
5 Dilution methods
6 Pipetting, including use of micropipettes
7 Microscopy, including use of counting chambers
8 Determination of absorption of light
9 Gel electrophoresis

V Microbiological Methods

1 Preparing nutrient media
2 Aseptic techniques (flaming and heating glass material)
3 Inoculation techniques

VI Statistical methods

1 Probability and probability distributions
2 Application of mean, median, percentage, variance, standard deviation, standard error, T test, chi-square test

VII Handling equipment

Due to differences in the equipment between participating countries, these skills can only be evaluated if the competitors have been informed beforehand about the algorithm, how to use the equipment, how to proceed with a particular experiment, ...etc.

Appendix III

DECLARATION FORM
FOR
COMPETITORS

I, as the competitor of _____ assure that;
Name of the country

- I was a student of a school for general secondary education in my country.
- I am one of the winners of the National Biology Olympiad of the current school year in my country
- I was not trained or instructed within a selected group of 50 or fewer students comprising the IBO team for a period longer than two weeks
- I was born on the 1st of July or later of the actual IBO year, minus twenty.
- I have not participated already twice in the IBO
- I have not yet started the regular education at a university.

I also agree that I will deposit to the organizers or to other indicated persons my computer, mobile phone, pager, personal organizer, communicable watch, etc. prior to practical and theoretical tests .

	Name	Signature
Competitor 1		
Competitor 2		
Competitor 3		
Competitor 4		

Teamleaders confirming this:

Team Leader 1		
Team Leader 2		

Date _____

APPENDIX IV: List of member countries (up to 2005)

The year of the first participation in the Olympiad is indicated in brackets.

Belgium	(1990)	Mongolia	(1997)
Bulgaria	(1990)	Romania	(1997)
Czechoslovakia	*(1990-1992)*	Estonia	(1998)
Germany	(1990)	Ireland	(1998)
Poland	(1990)	Korea	(1998)
Soviet Union	*(1990-1991)*	Moldova	(1998)
The Netherlands	(1991)	United Kingdom	(1998)
Sweden	(1991)	Switzerland	(1999)
Thailand	(1991)	Iran	(1999)
Australia	(1992)	Mexico	(1999)
Belarus	(1992)	Chinese Taipei	(1999)
Turkey	(1992)	India	(2000)
Russia	(1992)	Indonesia	(2000)
Ukraine	(1992)	Singapore	(2001)
China	(1993)	Slovenia	(2001)
Czech Republic	(1993)	Cyprus	(2002)
Slovak Republic	(1993)	Mozambique	(2002)
Azerbaijan	(1994)	USA	(2003)
Kazakhstan	(1994)	Canada	(2004)
Kyrgyzstan	(1994)	Brazil	(2005)
Kuwait	(1995)	Brunei	(2005)
Latvia	(1995)	Denmark	(2005)
Tajikistan	(1995)	Greece	(2005)
Turkmenistan	(1995)	Japan	(2005)
Argentina	(1996)	New Zealand	(2005)
Vietnam	(1996)	Spain	(2006)
Finland	(1997)	Pakistan	(2006)

New member countries accepted in 2006 and invited to participate for the first time in 2007 (provided they fulfill the associated duties) are: Bolivia, France, Lithuania and Peru.
The list of countries having organized an IBO in the past can be found on page 6 (History).
The next scheduled organizers are Canada (2007), India (2008), and Korea (2010). Preliminary applications are Greece (2009), Chinese Taipei (2011), Cyprus (2012), Finland (2013), Iran (2014), Denmark (2015).
A list with addresses can be obtained from the Coordinating Center in Prague.

APPENDIX V

Format for NBO description and IBO team selection procedure

1. Country	
2. Name	
3. Established	
4. Logo	
5. Posters	
6. Webpage	
7. Organization structure, categories and rounds	
8. Tests	
9. Student training	
10. Study materials	
11. Awarding of students, prizes	
12. Financial support / resources	
13. Support of Min. of Education	
14. National Competition Rules	
15. Selection procedure for IBO competition	
16. National committee (presidents by periods)	
17. Working groups	
18. Participating in IBO, observer, participant, organizer	
19. IBO coordinator (name address, email)	
20. Statistics over the years	
21. References	

Appendix VI List with URL addresses of National Biology Olympiads websites

Argentina (Spanish) (IBO 2006)	http://www.olimpiadadebiologia.com http://www.ibo2006.org.ar
Australia (English) (IBO 2004)	http://www.aso.edu.au/www/index.cfm?itemid=4 http://www.ibo2004.org.au/
Azerbaijan (Azerbaijanian)	http://www.azolympiad.com
Belarus (IBO 2003)	http://www.ibo2003.bsu.by
Belgium (Flemish) Belgium (French and German) (IBO 2001)	http://www.vob-ond.be/Olympiades/Vlaamse olympiade/Vlaamse biologieolympiade.html http://www.probio.be/olym_bio.htm http://ibo2001.naturalsciences.be/
Brazil (Portuguese)	http://www.anbiojovem.org.br
Canada (English)	http://www.usask.ca/biology/cbo/
China (IBO 2005)	http://www.ibo2005.org.cn
Chinese Taipei (Chinese) Chinese Taipei (English)	http://www.ntnu.edu.tw/bio/ibo.htm http://140.122.143.143/eng/Home_page.htm
Czech Rep	http://www.biologickaolympiada.cz
Denmark	http://www.emu.dk/gym/fag/bi/inspiration/biool.html
Estonia (Estonian) Estonia (Russian) Estonia (English)	http://www.ebo.ee/ http://www.ebo.ee/pyc/index.html http://www.ebo.ee/eng/index.html
Finland	http://www.bmol.fi/ibo/index.htm

Germany (German) Germany (English)	http://www.biologieolympiade.de http://www.biology-olympiad.de
Greece	http://www.pev.gr
India	http://www.hbcse.tifr.res.in/olympiads/Data/ObjectType/subbio
Indonesia	http://www.tobi.or.id
Iran (Farsi) Iran (English)	http://www.freewebs.com/irbo/ http://www.ysc.ac.ir http://biology.blogsky.com/
Ireland	http://iso.dcu.ie/biology
Japan	http://www.jbo-info.jp
Korea	http://bioedu.web.riss4u.net
Latvia (IBO 2002)	http://www.ibo2002.lv
Lithuania	http://www.olimpiados.lt/olimp.php/biologija http://www.litbo.tik.lt
Mexico	http://www.amc.unam.mx/programas/c_pobiologia.htm http://www.fciencias.unam.mx/Cursos/Biologia/AnimalesII/olimpiada.html
Netherlands	http://www.biologieolympiade.nl
Nigeria	http://www.still-learning.info/biology_olympiad.htm
Poland	http://www.olimpbiol.uw.edu.pl
Singapore	http://www.sibiol.org.sg
Slovakia	http://www.fns.uniba.sk/bioolymp/
Slovenia	http://www2.arnes.si/~ljzotks2/gzm/biologija/index.html
Sweden (IBO 1999)	http://www.biologilararna.nu http://teacher.ru.orebro.se/ibo/

Switzerland (German) Switzerland (French) Switzerland (Italian) Switzerland (English)	http://www.ibosuisse.ch http://www.ibosuisse.ch/index.php?language=fr http://www.ibosuisse.ch/index.php?language=it http://www.ibosuisse.ch/index.php?language=en
Turkey	http://www.tubitak.gov.tr
UK	http://www.iob.org/?tree=000_008_001
USA	http://www.cee.org/usabo/index.shtml
IBO Coord Center	http://www.nidm.cz/a_ib_uv.php